IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended)   A computer-implemented method for identifying a file system element for restoration comprising:

receiving a request to restore a file system element;

determining an offset, from a beginning of a collection of records, indicating where a record associated with the file system element is located within the collection of records, wherein:

the collection of records includes a file metadata file that includes one or more variable-length records associated with those file system elements that are files and a directory metadata file that includes one or more variable-length records associated with those file system elements that are files; and

the record includes metadata ~~that identifies one or more locations of data blocks on storage that comprise~~ associated with the file system element;

determining whether the file system element is a file or a directory;

using the determined offset to retrieve the record from the collection of records on a storage device, including by retrieving the record from the file metadata file at the determined offset in the event the file system element is a file or by retrieving the record from the directory metadata file at the determined offset in the event the file system element is a directory; and

restoring the file system element using the metadata included in the retrieved record ~~by accessing the data blocks that comprise the file system element from storage at the one or more identified locations~~.

2. (Cancelled)

3. (Currently amended)   The method of claim [[2]] 1, wherein a most significant bit indicates whether the ~~type of~~ file system element being restored is a file or a directory.

4. (Currently amended)   The method of claim 3, wherein the most significant bit <u>and/or the offset</u> is/<u>are</u> stored in a table.

5 – 12. (Cancelled)

13. (Previously presented)   The method of claim 1, wherein the record is a first record and determining an offset includes retrieving a second record associated with the file system element being restored, that includes the offset of the first record.

14 – 16. (Cancelled)

17. (Original) The method of claim 1, f urther comprising determining a second offset of a second record associated with the record.

18. (Currently amended)   The method of claim 1, wherein the association of the record with the file system element occurs via an inode <u>and/or a value that uniquely identifies the file system element</u>.

19. (Cancelled)

20. (Currently amended) A system for identifying a file system element for restoration comprising:

    a processor configured to:

        receive a request to restore a file system element;

        determine an offset, from a beginning of a collection of records, indicating where a record associated with the file system element is located within the collection of records, wherein<u>:</u>

            <u>the collection of records includes a file metadata file that includes one or more variable-length records associated with those file system elements that are files and a directory metadata file that includes one or more variable-length records associated with those file system elements that are files; and</u>

the record includes metadata ~~that identifies one or more locations of data blocks on storage that comprise~~ associated with the file system element;

determine whether the file system element is a file or a directory;

use the determined offset to retrieve the record from the collection of records, including by retrieving the record from the file metadata file at the determined offset in the event the file system element is a file or by retrieving the record from the directory metadata file at the determined offset in the event the file system element is a directory; and

restore the file system element using the metadata included in the retrieved record ~~by accessing the data blocks that comprise the file system element from storage at the one or more identified locations~~; and

a storage device on which the collection of records is stored.

21. (Currently amended) A computer program product for identifying a file system element for restoration, the computer program product being embodied in a computer readable medium and comprising computer instructions for:

receiving a request to restore a file system element;

determining an offset, from a beginning of a collection of records, indicating where a record associated with the file system element is located within the collection of records, wherein:

the collection of records includes a file metadata file that includes one or more variable-length records associated with those file system elements that are files and a directory metadata file that includes one or more variable-length records associated with those file system elements that are files; and

the record includes metadata ~~that identifies one or more locations of data blocks on storage that comprise~~ associated with the file system element;

determining whether the file system element is a file or a directory;

using the determined offset to retrieve the record from the collection of records, including by retrieving the record from the file metadata file at the determined offset in the event the file system element is a file or by retrieving the record from the directory metadata file at the determined offset in the event the file system element is a directory; and

restoring the file system element <u>using the metadata included in the retrieved record</u> ~~by accessing the data blocks that comprise the file system element from storage at the one or more identified locations.~~

22. (Previously presented)   The method of claim 1, wherein the record has a variable length.

23.   (Previously presented)   The method of claim 1, wherein:

receiving the request includes receiving a path, which includes a root, to the file system element within a file system; and

determining the offset includes:

accessing a root record associated with the root; and

in the event there is a next path element in the path after the root, determining from the accessed root record an inode number of the next path element.

24.   (Previously presented)   The system of claim 20, wherein:

the processor is configured to receive the request by receiving a path, which includes a root, to the file system element within a file system; and

the processor is configured to determine the offset by:

accessing a root record associated with the root; and

in the event there is a next path element in the path after the root, determining from the accessed root record an inode number of the next path element.

25.   (Previously presented)   The computer program product of claim 21, wherein:

the computer instructions for receiving the request include computer instructions for receiving a path, which includes a root, to the file system element within a file system; and

the computer instructions for determining the offset include computer instructions for:

accessing a root record associated with the root; and

in the event there is a next path element in the path after the root, determining from the accessed root record an inode number of the next path element.

26.   (Previously presented)   The method of claim 1 further comprising determining a type of file system element being restored, wherein in the event the file system element is a

directory: the components of the file system element include one or more children of the directory, the record identifies the children of the directory, and restoring the file system element includes adding the children of the directory identified by the record to a list of file system elements to be restored.

27. (Previously presented)   The system of claim 20, wherein the processor is further configured to determine a type of file system element being restored, wherein in the event the file system element is a directory: the components of the file system element include one or more children of the directory, the record identifies the children of the directory, and the processor is configured to restore the file system element by adding the children of the directory identified by the record to a list of file system elements to be restored.

28. (Previously presented)   The computer program product of claim 21 further comprising computer instructions for determining a type of file system element being restored, wherein in the event the file system element is a directory: the components of the file system element include one or more children of the directory, the record identifies the children of the directory, and restoring the file system element includes adding the children of the directory identified by the record to a list of file system elements to be restored.

29. (New) The method of claim 23, wherein determining the offset further includes in the event there is a next path element in the path after the root:
multiplying the inode number of the next path element with an integer to generate a location in an inode index table; and
accessing the inode index table at the location generated by multiplying to retrieve an offset of a record associated with the next path element.

30. (New) The system of claim 24, wherein the processor is further configured to determine the offset in the event there is a next path element in the path after the root by:
multiplying the inode number of the next path element with an integer to generate a location in an inode index table; and
accessing the inode index table at the location generated by multiplying to retrieve an offset of a record associated with the next path element.

31.   (New) The computer program product of claim 25, wherein the computer instructions for determining the offset further includes in the event there is a next path element in the path after the root computer instructions for:

multiplying the inode number of the next path element with an integer to generate a location in an inode index table; and

accessing the inode index table at the location generated by multiplying to retrieve an offset of a record associated with the next path element.

32.   (New) The method of claim 1, wherein:

each record in the file metadata file includes (1) an inode number of a file that that record is associated with, (2) one or more attributes of the file that that record is associated with, and (3) one or more locations of data blocks on storage that comprise the file that that record is associated with; and

each record in the directory metadata file includes (1) an inode number of a directory that that record is associated with and (2) inode numbers of children, if any, of the directory that that record is associated with.

33.   (New) The system of claim 20, wherein:

each record in the file metadata file includes (1) an inode number of a file that that record is associated with, (2) one or more attributes of the file that that record is associated with, and (3) one or more locations of data blocks on storage that comprise the file that that record is associated with; and

each record in the directory metadata file includes (1) an inode number of a directory that that record is associated with and (2) inode numbers of children, if any, of the directory that that record is associated with.

34.   (New) The computer program product of claim 21, wherein:

each record in the file metadata file includes (1) an inode number of a file that that record is associated with, (2) one or more attributes of the file that that record is associated with, and (3) one or more locations of data blocks on storage that comprise the file that that record is associated with; and

each record in the directory metadata file includes (1) an inode number of a directory that that record is associated with and (2) inode numbers of children, if any, of the directory that that record is associated with.